In the claims:

1. (Currently amended) An apparatus for blending an acid and a base to form a mixture, comprising:

   (a) a chamber;

   (b) a distribution-blending-cooling dish suspended therein;

   (c) an acid delivery system for introducing the acid into the chamber and to the distribution-blending-cooling dish; and

   (d) a base delivery system for introducing the base into the chamber via the distribution-blending-cooling dish;

   wherein the distribution-blending-cooling dish has a concave shape and a depth which forces the acid and the base ~~are mixed~~ to mix within a thin layer on the distribution-blending-cooling dish, and then *in situ* mixing occurs within the chamber below the distribution-blending-cooling dish, and wherein the acid delivery system and the base delivery system are separate.

2. (Cancelled)

3. (Cancelled)

4. (Cancelled)

5. (Cancelled)

6. (Original) The apparatus of claim 1, wherein an inside surface of the chamber comprises a non-corrosive coating.

7. (Previously amended) The apparatus of claim 6, wherein the non-corrosive coating comprises a derivative of fluoro polymers.

8. (Previously amended) The apparatus of claim 6, wherein the non-corrosive coating comprises ethyl tetrafluoro ethylene.

9. (Previously amended) The apparatus of claim 1, further comprising a chamber cooling coil coupled to the chamber to lower a temperature of the chamber.

10. (Original) The apparatus of claim 9, further comprising a chamber temperature sensor, coupled to the chamber, the chamber temperature sensor sensing temperature of the chamber, and the chamber cooling coil cooperating with the chamber temperature sensor to regulate the temperature.

11. (Previously amended) The apparatus of claim 1, further comprising a dish cooling coil coupled to the distribution-blending-cooling dish, to lower a temperature of the distribution-blending-cooling dish.

12. (Previously amended) The apparatus of claim 11, further comprising a dish temperature sensor, coupled to the distribution-blending-cooling dish, wherein the dish temperature sensor senses the temperature of the distribution-blending-cooling dish and the dish cooling coil cooperating with the dish temperature sensor to regulate the temperature of the distribution-blending-cooling dish.

13. (Cancelled)

14. (Cancelled)

15. (Original) The apparatus of claim 1, wherein the distribution-blending-cooling dish comprises a non-corrosive coating.

16. (Previously amended) The apparatus of claim 15, wherein the non-corrosive coating comprises a derivative of fluoro polymers.

17. (Previously amended) The apparatus of claim 15, wherein the non-corrosive coating comprises ethyl tetrafluoro ethylene.

18. (Original) The apparatus of claim 1, wherein the acid delivery system comprises a spray mechanism.

19. (Currently amended) The apparatus of claim 1, wherein the acid delivery system ~~comprises in-air mixing~~ and the base delivery system are strategically placed to introduce the acid and the base into the chamber in a manner that causes in-air mixing of the acid and the base above the distribution-blending-cooling dish.

20. (Cancelled)

21. (Cancelled)

22. (Cancelled)

23. (Cancelled)

24. (Original) The apparatus of claim 1, wherein the base delivery system comprises a spray mechanism.

25. (Cancelled)

26. (Cancelled)

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)

30. (Cancelled)

31. (Original) The apparatus of claim 1, wherein the acid delivery system comprises:

    (a) an acid pump; and

(b) an acid delivery nozzle, wherein the acid pump and the acid delivery nozzle are coupled thereto to introduce the acid into the chamber.

32. (Original) The apparatus of claim 1, wherein the acid delivery system comprises an acid reservoir.

33. (Original) The apparatus of claim 32, further comprising an acid reservoir cooling coil coupled to the acid reservoir, wherein the cooling coil operates to lower a temperature of the acid reservoir.

34. (Original) The apparatus of claim 1, wherein the acid delivery system comprises a device to regulate a rate of flow of the acid.

35. (Original) The apparatus of claim 34, wherein the device to regulate the rate of flow of the acid comprises an acid flow valve.

36. (Original) The apparatus of claim 34, wherein the device to regulate the rate of flow of the acid comprises an acid flow meter, and an acid flow valve, wherein the acid flow meter is coupled to the acid flow valve and reflects the flow of the acid.

37. (Original) The apparatus of claim 34, wherein the device comprises an acid flow controller that monitors an acid flow meter and adjusts an acid flow valve to maintain a rate of flow for the acid at a predetermined level.

38. (Currently amended) The apparatus of claim 37, wherein ~~the predetermined level comprises a programmable function of~~ the acid flow controller is programmable.

39. (Original) The apparatus of claim 1, wherein the acid delivery system is capable of regulating an amount of the acid delivered into the chamber.

40. (Original) The apparatus of claim 1, wherein the acid delivery system introduces the acid into the chamber at different points within the chamber.

41. (Previously amended) The apparatus of claim 40, wherein different points within the chamber comprise points below the distribution-blending-cooling dish, wherein the acid is diluted with water to give a diluted acid.

42. (Original) The apparatus of claim 1, wherein the acid delivery system comprises a vortex generator to generate a vortex of the acid.

43. (Previously amended) The apparatus of claim 42, wherein the vortex generator comprises:

    (a) a plurality of circulation eductors inside the chamber; and

    (b) a pump, in fluid communication with the plurality of circulation eductors;

        whereby the pump circulates the acid through the plurality of eductors to initiate a movement of the acid in a rotational direction to create a vortex.

44. (Original) The apparatus of claim 43, wherein the plurality of eductors are strategically placed inside the chamber at different elevations.

45. (Previously amended) The apparatus of claim 43, wherein the direction of the plurality of eductors within the chamber exerts control over the rotational speed of the acid and control over the size of the vortex.

46. (Cancelled)

47. (Currently amended) The apparatus of claim 43, ~~wherein the acid and the base are mixed within a thin layer on the distribution-blending-cooling dish to form a suspension that contains hard particles of an un-reacted base,~~ wherein the pump crushes ~~the hard~~ particles of the un-reacted base, and the acid delivery system delivers the un-reacted base or suspension thereof into the chamber via the distribution-blending-cooling dish.

48. (Cancelled)

49. (Original) The apparatus of claim 1, wherein the base delivery system comprises:

    (a) a base pump; and

    (b) a base delivery nozzle, wherein the base pump and the base delivery nozzle are coupled thereto to introduce the base into the chamber.

50. (Original) The apparatus of claim 1, wherein the base delivery system comprises a base reservoir that contains the base.

51. (Original) The apparatus of claim 50, wherein the base delivery system further comprises a base reservoir cooling coil coupled to the base reservoir to lower temperature of the base reservoir.

52. (Previously amended) The apparatus of claim 51, further comprising a base reservoir temperature sensor, coupled to the base reservoir; wherein the base reservoir temperature sensor senses a temperature of the base reservoir and the base reservoir cooling coil cooperating with the base reservoir temperature sensor to regulate the temperature of the base reservoir.

53. (Original) The apparatus of claim 1, wherein the base delivery system comprises a device to regulate a rate of flow of the base.

54. (Previously amended) The apparatus of claim 53, wherein the device to regulate the rate of flow of the base comprises a base flow valve.

55. (Original) The apparatus of claim 53, wherein the device to regulate the rate of flow of the base comprises a base flow meter, and a base flow valve, wherein the base flow meter is coupled to the base flow valve and reflects the flow of the base.

56. (Previously amended) The apparatus of claim 53, wherein the device comprises a base flow controller that monitors a base flow meter and adjusts a base flow valve to maintain a rate of flow for the base at a predetermined level.

57. (Currently amended) The apparatus of claim 56, wherein ~~the predetermined level is a programmable function of~~ the base flow controller is programmable.

58. (Original) The apparatus of claim 1, wherein the base delivery system is capable of regulating an amount of the base delivered into the chamber.

59. (Previously amended) The apparatus of claim 1, further comprising a precipitate chamber connected to the chamber for allowing the precipitation of solids.

60. (Previously amended) The apparatus of claim 59, further comprising a filter chamber connected to the precipitate chamber for filtering the mixture.

61. (Previously amended) The apparatus of claim 60, further comprising a storage chamber connected to the filter chamber for storing the mixture.

62. (Currently amended) An apparatus for blending an acid and a base to form a mixture, comprising:

(a) a chamber;

(b) a distribution-blending-cooling dish suspended therein;

(c) an acid delivery system for spraying the acid into the chamber and to the distribution-blending-cooling dish, wherein the acid delivery system is capable of regulating a rate of flow and an amount of the acid sprayed into the chamber; and

(d) a base delivery system for spraying the base into the chamber via the distribution-blending-cooling dish, wherein the base delivery system is capable of regulating a rate of flow and an amount of the base sprayed into the chamber, and wherein the acid delivery system and the base delivery system are separate;

wherein blending of the acid and the base comprises in-air mixing above the distribution-blending-cooling dish and proximate the

acid delivery system, progressive mixing continues within <u>the distribution-blending-cooling dish, which has a concave shape and a depth which forces the acid and the base to mix within</u> a thin layer on the surface of the distribution-blending-cooling dish, and *in situ* mixing occurs within the chamber below the distribution-blending-cooling dish.

63. (Cancelled)

64. (Cancelled)

65. (Cancelled)

66. (Cancelled)

67. (Original) The apparatus of claim 62, wherein an inside surface of the chamber comprises of a non-corrosive coating.

68. (Previously amended) The apparatus of claim 67, wherein the non-corrosive coating comprises a derivative of fluoro polymers.

69. (Previously amended) The apparatus of claim 67, wherein non-corrosive coating comprises ethyl tetrafluoro ethylene.

70. (Previously amended) The apparatus of claim 62, further comprising a chamber cooling coil coupled to the chamber to lower a temperature of the chamber.

71. (Original) The apparatus of claim 70, further comprising a chamber temperature sensor, coupled to the chamber, the chamber temperature sensor sensing temperature of the chamber, and the chamber cooling coil cooperating with the chamber temperature sensor to regulate the temperature.

72. (Previously amended) The apparatus of claim 62, further comprising a dish cooling coil coupled to the distribution-blending-cooling dish to lower a temperature of the distribution-blending-cooling dish.

73. (Original) The apparatus of claim 72, further comprising a dish temperature sensor, coupled to the distribution-blending-cooling dish, wherein the dish temperature sensor senses the temperature of the distribution-blending dish, and the dish cooling coil cooperating with the dish temperature sensor to regulate the temperature of the distribution-blending-cooling dish.

74. (Cancelled)

75. (Cancelled)

76. (Original) The apparatus of claim 62, wherein the distribution-blending-cooling dish comprises a non-corrosive coating.

77. (Previously amended) The apparatus of claim 76, wherein the non-corrosive coating comprises a derivative of fluoro polymers.

78. (Previously amended) The apparatus of claim 76, wherein non-corrosive coating comprises ethyl tetrafluoro ethylene.

79. (Original) The apparatus of claim 62, wherein the acid delivery system comprises:

(a) an acid reservoir;

(b) an acid flow valve; and

(c) an acid flow meter;

wherein the acid reservoir that contains the acid is coupled to the acid flow valve that controls rate of flow of the acid, and is coupled to the acid flow meter that measures the flow of the acid.

80. (Original) The apparatus of claim 79, further comprising an acid reservoir cooling coil coupled to the acid reservoir to lower a temperature of the acid reservoir.

81. (Original) The apparatus of claim 79, wherein the acid flow meter is coupled to the acid flow valve and reflects the flow of the acid, wherein an acid flow controller monitors the acid flow meter, and the acid flow controller is capable of adjusting the acid flow valve to maintain a rate of flow for the acid at a predetermined level.

82. (Currently amended) The apparatus of claim 81, wherein ~~the predetermined level is a programmable function of~~ the acid flow controller <u>is programmable</u>.

83. (Original) The apparatus of claim 62, wherein the acid delivery system is capable of regulating an amount of the acid delivered into the chamber.

84. (Original) The apparatus of claim 62, wherein the acid delivery system introduces the acid into the chamber at different points within the chamber.

85. (Original) The apparatus of claim 84, wherein different points within the chamber comprise points below the distribution-blending-cooling dish, wherein the acid is diluted with water to give a diluted acid.

86. (Previously amended) The apparatus of claim 62, wherein the acid delivery system comprises a vortex generator , and wherein the vortex generator comprises:

(a) a plurality of circulation eductors inside the chamber; and

(b) a pump, in fluid communication with the circulation eductors;

whereby the pump circulates the acid through the plurality of eductors to initiate a movement of the acid in a rotational direction to create a vortex.

87. (Previously amended) The apparatus of claim 86, wherein the plurality of eductors are strategically placed inside the chamber at different elevations.

88. (Previously amended) The apparatus of claim 86, wherein the direction of the plurality of eductors within the chamber exerts control over the rotational speed of the acid and control over the size of the vortex.

89. (Cancelled)

90. (Currently amended) The apparatus of claim 86, ~~wherein the acid and the base are mixed within a thin layer on the distribution-blending-cooling dish to form a suspension that contains hard particles of an un-reacted base,~~ wherein the pump crushes ~~the hard~~ particles of the un-reacted base, and the acid delivery system delivers the un-reacted base or suspension thereof into the chamber via the distribution-blending-cooling dish.

91. (Original) The apparatus of claim 86 wherein the pump is a peristaltic pump.

92. (Cancelled)

93. (Original) The apparatus of claim 62, wherein the base delivery system comprises:

(a) a base reservoir;

(b) a base flow valve; and

(c) a base flow meter;

wherein the base reservoir that contains the base is coupled to the base flow valve that controls rate of flow of the base, and is coupled to the base flow meter that measures the flow of the base.

94. (Previously amended) The apparatus of claim 93, further comprising a base reservoir cooling coil coupled to the base reservoir to lower a temperature of the base reservoir.

95. (Previously amended) The apparatus of claim 93, wherein the base flow meter is coupled to the base flow valve and reflects the flow of the base, wherein a base flow controller monitors the base flow meter and the base flow controller is capable of adjusting the base flow valve to maintain a rate of flow for the base at a predetermined level.

96. (Currently amended) The apparatus of claim 95, wherein ~~the predetermined level is a programmable function of~~ the base flow controller is programmable.

97. (Previously amended) The apparatus of claim 62, further comprising a precipitate chamber connected to the chamber for allowing the precipitation of solid particles.

98. (Previously amended) The apparatus of claim 97, further comprising a filter chamber connected to the precipitate chamber for filtering the mixture.

99. (Previously amended) The apparatus of claim 98, further comprising a storage chamber connected to the filter chamber for storing the mixture.

Applicants have carefully considered this Application in connection with the Examiner's Action, and respectfully request reconsideration of this Application in view of the above Amendment and the following remarks.

Applicants have cancelled Claims 2 – 5, 13, 14, 20 – 23, 25 – 30, 46 – 48, 63 – 66, 74, 75, 89, and 92.

Pending in the application are Claims 1, 6 – 12, 15 – 19, 24, 31 – 45, 49 – 62, 67 – 73, 76 – 88, 90 – 91, and 93 – 99.

Applicants have amended Claims 1 and 62 to clarify that the distribution-blending-cooling dish has a concave shape and a depth which forces the acid and the base to mix in a thin layer on its surface. Support for these amendments may be found within paragraphs 15, 16, and 23 of the Specification.

Applicants have also amended Claims 1 and 62 to clarify that the acid delivery system and the base delivery system are separate. Support for these amendments may be found within Figure 1, which illustrates the delivery systems as being separate. Support may also be found within paragraph 16 of the Specification, which describes the **first** blending of the acid and the base occurring **in the air** above the distribution-blending-cooling dish. For this to occur, the acid and base must have been delivered through separate delivery systems.

I. Rejections Under 35 U.S.C. §103(a)

A. U.S. Patent No. 3,881,700 to Bradford

Claims 1 – 5, 13, 14, 18 – 39, 49, 50, 51 – 66, 74 – 75, 80, 83, 94, and 97 – 99 stand rejected under 35 U.S.C. §103(a) as being obvious in light of U.S. Patent No. 3,881,700 to Bradford ("Bradford"). Applicants respectfully submit that these rejections have been rendered moot as to those claims which have been cancelled. Applicants also respectfully submit that Bradford does not render the pending claimed subject matter obvious because Bradford does not teach or suggest all of the claim limitations.

Claims 1 and 62 have been amended to recite that **the distribution-blending-cooling dish must have a concave shape and a minimal depth, which forces the acid and base to mix in a thin layer on its surface**. Bradford does not teach or suggest a distribution-blending-cooling dish having a **concave** shape. Bradford's cup-shaped member has a "square bottom 40 with side walls 42 extending upwardly therefrom at an angle approximately 45 degrees." *See* Bradford, Col. 3, lines 8 – 10; Figures 2 – 4. Because of its shape, Bradford's cup-shaped member **does not have a depth which forces the acid and the base to mix in a thin layer**. In addition, **because Bradford is directed to water treatment processing, Bradford does not suggest using a dish with a depth** to force thin layer mixing, which is advantageous for mixing acids and bases but is irrelevant to water treatment processing.

Furthermore, Claims 1 and 62 have been amended to recite that **the acid delivery system and the base delivery system are separate**. Bradford does not teach separate delivery systems. Rather, **Bradford teaches a single conduit pipe, through which both the soiled water and the treatment chemicals are delivered to the chamber**. *See*, Bradford, Figure 1.

To establish a prima facie case of obviousness based on a combination of the content of various references, there must be some teaching, suggestion or motivation in the prior art to make the specific combination that was made by the applicant. *See In re Raynes*, 28 U.S.P.Q.2d 1630, 1631 (Fed. Cir. 1993). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *See In re Vaeck*, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

For these reasons, Bradford does not render the claimed subject matter obvious.

B. Bradford in view of U.S. Patent No. 2,930,677 to Van Loenen

Claims 6 – 8, 15 – 17, 67 – 69, and 76 – 78 stand rejected under 35 U.S.C. §103(a) as being obvious with respect to Bradford in view of U.S. Patent No. 2,930,677 to Van Loenen ("Van Loenen"). Applicants respectfully submit that, as described above, **Bradford does not teach or suggest all of the elements of underlying Claims 1 and 62**. Bradford does not teach

or suggest a distribution-blending-cooling dish having a concave shape and a depth to force mixing of an acid and a base in a thin layer. Furthermore, Bradford's single conduit pipe is not structurally equivalent to the separate acid and base delivery systems of the claims. Thus, in the absence of a teaching or suggestion within the references to create the claimed subject matter, neither Bradford nor Bradford in view of Van Loenen renders the claimed subject matter obvious.

C. U.S. Patent No. 5,782,556 to Chu

Claims 1 – 5, 13, 14, 18 – 32, 34 – 40, 42, 49, 50, 53 – 58, 61 – 66, 74 – 75, 83, 84, and 99 stand rejected under 35 U.S.C. §103(a) as being anticipated by U.S. Patent No. 5,782,556 to Chu ("Chu"). Applicants respectfully submit that these rejections have been rendered moot as to those claims which have been cancelled. Applicants also respectfully submit that Chu does not render the pending claimed subject matter obvious because Chu does not teach or suggest all of the claim limitations.

In particular, **Chu does not teach or suggest a distribution-blending-cooling dish having a concave shape and a depth which forces the acid and base to mix in a thin layer**. Claims 1 and 62 have been amended to recite this element. Chu **does not teach or suggest a distribution-blending-cooling dish having a concave shape**. Chu's conical filter is cone-shaped. Furthermore, **the conical shape of the filter of Chu inherently does not have a depth which forces liquids to mix in a thin layer,** because gravity forces the liquids to converge into a central, cone-shaped mass in the bottom point of the conical filter. Thus, the conical filter of Chu is not structurally equivalent to Applicant's distribution-blending-cooling dish and cannot carry out its intended use. Chu does not teach or suggest every element of the claims.

For these reasons, the claims are patentable over Chu.

D. Chu in view of U.S. Patent No. 4,164,541 to Platz et al.

Claims 41, 43 – 48, and 85 – 92 stand rejected under 35 U.S.C. §103(a) as being obvious with respect to Chu in view of U.S. Patent No. 4,164,541 to Platz et al. ("Platz"). Applicants

respectfully submit that, as described above, **Chu does not teach or suggest all of the elements of underlying Claims 1 and 62**. Chu does not teach or suggest a distribution-blending-cooling dish having a concave shape and a depth which forces mixing of an acid and a base in a thin layer. Thus, in the absence of a teaching or suggestion within the references to create the claimed subject matter, neither Chu nor Chu in view of Platz renders the claimed subject matter obvious.

E. U.S. Patent No. 2,236,694 to Balla et al.

Claims 1 – 5, 9 – 14, 62 – 66, 70 – 75 and 83 stand rejected under 35 U.S.C. §103(a) as being obvious in light of U.S. Patent No. 2,236,694 to Balla et al. ("Balla"). Applicants respectfully submit that these rejections have been rendered moot as to those claims which have been cancelled. Applicants also respectfully submit that Balla does not render the pending claimed subject matter obvious because Balla does not teach or suggest all of the claim limitations.

Balla does not teach **or suggest a distribution-blending-cooling dish having a concave shape and a minimal depth which forces the acid and base to mix in a thin layer**. Claims 1 and 62 have been amended to recite these elements. The Examiner asserts that the "inner vessel" of Balla is equivalent to Applicants' distribution-blending-cooling dish. Balla teaches a single reactor (11) with an interior (33) and a ducting system (16). *See* Balla, Figure 1, Page 4, last paragraph. **Balla's "exchangable reaction vessels" having different sizes are not equivalent to a distribution-blending-cooling dish having the structural characteristics of the current claims**. Applicants respectfully assert that the "inner vessel" of Balla is not of minimal depth, nor can it force the mixing of acid and base in a thin layer. Furthermore, Balla does not teach or suggest separate acid and base delivery systems because Balla utilizes a single delivery system or feeder (19). *See* Balla, page 3, second to last paragraph. For this reason, the claims are patentable over Balla.

II. **Rejections Under 35 U.S.C. §112, Second paragraph**

Applicants have cancelled Claims 2 – 5, 22, 23, 28 – 30, 46, 48, 63 – 66, 89, and 92. Thus, the rejections of these claims under 35 U.S.C. §112, Second paragraph have been rendered moot.

III. **Conclusion**

Applicants respectfully submit that, in light of the foregoing Amendment and comments, Claims 1, 6 – 12, 15 – 19, 24, 31 – 45, 49 – 62, 67 – 73, 76 – 88, 90 – 91, and 93 – 99 are in condition for allowance. A Notice of Allowance is therefore requested.

If the Examiner has any other matters which pertain to this Application, the Examiner is encouraged to contact the undersigned to resolve these matters by Examiner's Amendment where possible.

Respectfully submitted,

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March 15, 2004
Date